

Amendment and Response

Applicant: Heinz Mattes et al.

Serial No.: 10/566,461

Filed: September 18, 2006

Docket No.: I431.147.101/FIN501PCT/US

Title: DEVICE AND METHOD FOR TESTING INTEGRATED CIRCUITS

IN THE CLAIMS

21. (Currently Amended) A test device for testing integrated circuits, including dynamic AD converters, the test device comprising:
- a precision signal generator, configured for generating a test signal
 - and coupled to an input contact for coupling to an input of an integrated circuit;
 - at least one reference signal generator configured for generating a reference signal the reference signal generator having a calibration line and a reference line; and
 - at least one comparator unit for the input contact, the comparator unit being connected to the calibration line and to the reference line of the reference signal generator and having a calibration unit, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal;
 - the comparator unit also being operable in a calibration mode configured such that the switching properties of the comparator unit are adjustable by the calibration unit by means of the signal values of the calibration line which are present at the comparator unit and by means of the reference line.
22. (Previously Presented) The test device according to claim 21, comprising wherein two reference signal generators are provided, the first reference signal generator configured for generating a lower reference signal and the second reference signal generator configured for generating an upper reference signal, a first comparator unit, which is connectable to the first reference signal generator, and a second comparator unit, which is connectable to the second reference signal generator, being provided for each input contact.
23. (Canceled)

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24. (Currently Amended) The test device according to ~~claim 23~~ claim 21, comprising wherein the comparator unit is switchable back and forth between the test mode and the calibration mode.

25. (Canceled)

26. (Currently Amended) A test device for testing integrated circuits, including dynamic AD converters, the test device comprising:

a precision signal generator, configured for generating a test signal
and coupled to an input contact for coupling to an input of an integrated circuit;
at least one reference signal generator configured for generating a
reference signal; and

at least one comparator unit for the input contact, the comparator unit being operable in a
test mode and being configured such that the test signal is compared with the reference signal
and that the precision signal generator can be turned off by the comparator unit if the test signal
exceeds or falls below the reference signal;

~~The test device according to claim 25, comprising~~ wherein the comparator unit includes a
comparator that has two inputs and an output, the first input of the comparator being coupled to
the reference line of the reference signal generator, the second input of the comparator being
coupled to the calibration line of the reference signal generator and to the connecting line of ~~its~~
the input contact for coupling to the input of the integrated circuit, the output of the comparator
being coupled to the calibration unit and to the precision signal generator and the switching
properties of the calibration unit being adjustable by the comparator.

27. (Currently Amended) A test device for testing integrated circuits, including dynamic AD converters, the test device comprising:

a precision signal generator, configured for generating a test signal and coupled to an
input contact for coupling to an input of an integrated circuit;
at least one reference signal generator configured for generating a reference signal; and

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at least one comparator unit for the input contact, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal;

~~The test device according to one of claims 21, comprising~~ wherein a decision logic unit is coupled to the comparator unit and which is configured such that control signals are generated for the precision signal generator from the output signals of the comparator unit.

28. (Previously Presented) The test device according to claim 21, wherein a respective output contact for coupling to an output of an integrated circuit is provided for each input contact, the output contact being coupled to an output line.

29. (Previously Presented) The test device according to claim 28, wherein a validation signal line leads from the comparator unit to the relevant output line.

30. (Previously Presented) The test device according to claim 21, comprising wherein the test device is monolithically integrated on an integrated circuit.

31. (Currently Amended) A load board for receiving at least one needle card for testing integrated circuits and having at least one test receptacle for testing integrated circuits and for connecting a handler to a tester of integrated circuits, the load board having a test device ~~according to claim 21, including dynamic AD converters,~~ the test device comprising:

a precision signal generator, configured for generating a test signal and coupled to an input contact for coupling to an input of an integrated circuit;

at least one reference signal generator configured for generating a reference signal; and

at least one comparator unit for the input contact, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal.

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32. (Currently Amended) A tester for testing integrated circuits comprising:
a plurality of instruments for generating signals or data streams; and a plurality of measuring sensors, for currents and voltages,
the tester having a load board for receiving at least one needle card for testing integrated circuits and for connecting a handler to a tester of integrated circuits and which is equipped with at least one test receptacle for testing integrated circuits; and
a test device ~~as claimed in claim 1,~~ including dynamic AD converters, the test device comprising:

a precision signal generator, configured for generating a test signal and coupled to an input contact for coupling to an input of an integrated circuit;
at least one reference signal generator configured for generating a reference signal;
and
at least one comparator unit for the input contact, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal;
the precision signal generator and the reference signal generator being formed on the tester, and the comparator unit with the calibration unit being arranged on the load board, adjacent to the input contacts for the integrated circuits.

33. (Currently Amended) A method for parallel testing of integrated circuits comprising:
providing a tester having a load board configured for receiving a plurality of needle cards for testing integrated circuits and for connecting a handler to a tester of integrated circuits and which is equipped with a plurality of test receptacles for testing integrated circuits;
populating the load board with a plurality of integrated circuits, a precision signal generator, at least one reference signal generator and, for each integrated circuit, a comparator unit;
carrying out a test mode having the following process:

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generation of a test signal by a precision signal generator and application of the test signal to the integrated circuits;

generation of at least one reference signal by the reference signal generator ~~by the reference signal generators~~ and application of the reference signal/reference signals to the comparator units; and

comparison of the test signal with the respective reference signal by the comparator units;

turning-off of the precision signal generator by one of the comparator units if the test signal exceeds or falls below the reference signal.

34. (Previously Presented) The method according to claim 33, wherein the reference signal generator has a calibration line and a reference line, in which case, before or after the test mode is carried out, a calibration mode having the following process comprises:

connecting the comparator unit to the calibration line and to the reference line of the relevant reference signal generator; and

setting the switching properties of the comparator units by means of the signal values of the calibration and the reference line which are present at the relevant comparator units.

35. (Canceled)

36. (Currently Amended) A storage medium containing a computer program for executing [[a]] the method for parallel testing of integrated circuits set forth in claim 33, which is configured such that method of claims 33 can be executed.

37-41. (Canceled)

42. (Currently Amended) A test device for testing integrated circuits, including dynamic AD converters, the test device comprising:

signal generator, configured for generating a test signal

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and coupled to an input contact for coupling to an input of an integrated circuit;

at least one reference signal generator configured for generating a reference signal; and

at least one comparator unit for input contact, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal, wherein two reference signal generators are provided, the first reference signal generator configured for generating a lower reference signal and the second reference signal generator configured for generating an upper reference signal, a first comparator unit, which is connectable to the first reference signal generator, and a second comparator unit, which is connectable to the second reference signal generator, being provided for each input contact;

~~The test device according to claim 41, comprising~~ wherein the first and second reference signal generator each have a calibration line and a reference line, each comparator unit being connected to the calibration line and to the reference line of the relevant reference signal generator, each comparator unit having a calibration unit, and the comparator unit also being operable in a calibration mode configured such that the switching properties of the comparator unit are adjustable by the calibration unit by means of the signal values of the calibration line which are present at the comparator unit and by means of the reference line.

43. (Previously Presented) The test device according to claim 42, comprising wherein each comparator unit is switchable back and forth between the test mode and the calibration mode.

44. (Canceled)

45. (New) A test device for parallel testing a plurality of integrated circuits, including dynamic AD converters, the test device comprising:

a precision signal generator, configured for generating a test signal and coupled to at least two input contacts for coupling to an input of an integrated circuit;

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at least one reference signal generator configured for generating a reference signal; and
at least one comparator unit for each input contact, the comparator unit being operable in a test mode and being configured such that the test signal is compared with the reference signal and that the precision signal generator can be turned off by the comparator unit if the test signal exceeds or falls below the reference signal.

46. (New) The test device according to claim 45, wherein two reference signal generators are provided, the first reference signal generator configured for generating a lower reference signal and the second reference signal generator configured for generating an upper reference signal, a first comparator unit, which is connectable to the first reference signal generator, and a second comparator unit, which is connectable to the second reference signal generator, being provided for each input contact.

47. (New) The test device according to claim 45, wherein the reference signal generator has a calibration line and a reference line, the comparator unit being connected to the calibration line and to the reference line of the reference signal generator, comparator unit having a calibration unit, and the comparator unit also being operable in a calibration mode configured such that the switching properties of the comparator unit are adjustable by the calibration unit by means of the signal values of the calibration line which are present at the comparator unit and by means of the reference line.